

What is claimed is:

1. An isolated nucleic acid encoding a mammalian hp15a receptor.
- 5 2. The nucleic acid of claim 1, wherein the nucleic acid is DNA.
3. The DNA of claim 2, wherein the DNA is cDNA.
- 10 4. The DNA of claim 2, wherein the DNA is genomic DNA.
5. The nucleic acid of claim 1, wherein the nucleic acid is RNA.
- 15 6. The nucleic acid of claim 1, wherein the mammalian hp15a receptor is a human hp15a receptor.
7. The nucleic acid of claim 6, wherein the nucleic acid encodes a human hp15a receptor which has an amino acid sequence identical to that encoded by the plasmid hp15a (ATCC Accession No. 209447).
- 20 8. An isolated nucleic acid encoding a human hp15a receptor analog.
- 25 9. The nucleic acid of claim 6, wherein the human hp15a receptor has an amino acid sequence identical to the amino acid sequence shown in Figure 2A-2C (Seq. I.D. No. 2).
- 30 10. A purified mammalian hp15a receptor protein.
11. The purified mammalian hp15a receptor protein of claim 10, wherein the hp15a receptor protein is a human hp15a receptor protein.
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12. A vector comprising the nucleic acid of claim 1.
13. A vector comprising the nucleic acid of claim 6.
- 5 14. A vector of claim 12 adapted for expression in a bacterial cell which comprises the regulatory elements necessary for expression of the nucleic acid in the bacterial cell operatively linked to the nucleic acid encoding the mammalian hp15a
10 receptor as to permit expression thereof.
- 15 15. A vector of claim 12 adapted for expression in an amphibian cell which comprises the regulatory elements necessary for expression of the nucleic acid in the amphibian cell operatively linked to the nucleic acid encoding the mammalian hp15a receptor as to permit expression thereof.
- 20 16. A vector of claim 12 adapted for expression in a yeast cell which comprises the regulatory elements necessary for expression of the nucleic acid in the yeast cell operatively linked to the nucleic acid encoding the mammalian hp15a receptor so as to permit expression thereof.
- 25 17. A vector of claim 12 adapted for expression in an insect cell which comprises the regulatory elements necessary for expression of the nucleic acid in the insect cell operatively linked to the nucleic acid
30 encoding the mammalian hp15a receptor so as to permit expression thereof.
18. The vector of claim 17 which is a baculovirus.
- 35 19. A vector of claim 12 adapted for expression in a mammalian cell which comprises the regulatory elements necessary for expression of the nucleic

acid in the mammalian cell operatively linked to the nucleic acid encoding the mammalian hp15a receptor so as to permit expression thereof.

- 5 20. The vector of claim 12, wherein the vector is a plasmid.
21. The plasmid of claim 20 designated hp15a (ATCC Accession No. 209447).
- 10 22. A cell comprising the vector of claim 12.
23. A cell of claim 22, wherein the cell is a non-mammalian cell.
- 15 24. A cell of claim 23, wherein the non-mammalian cell is a *Xenopus* oocyte cell or a *Xenopus* melanophore cell.
- 20 25. A cell of claim 22, wherein the cell is a mammalian cell.
26. A mammalian cell of claim 25, wherein the cell is a COS-7 cell, a 293 human embryonic kidney cell, a
25 NIH-3T3 cell, a LM(tk-) cell, a mouse Y1 cell, or a CHO cell.
27. An insect cell comprising the vector of claim 17.
- 30 28. An insect cell of claim 27, wherein the insect cell is an Sf9 cell, an Sf21 cell or a HighFive cell.
29. A membrane preparation isolated from the cell of any one of claims 22, 23, 25, or 27.
- 35 30. A nucleic acid probe comprising at least 15 nucleotides, which probe specifically hybridizes

with a nucleic acid encoding a mammalian hp15a receptor, wherein the probe has a unique sequence corresponding to a sequence present within one of the two strands of the nucleic acid encoding the mammalian hp15a receptor and are contained in plasmid hp15a (ATCC Accession No. 209447).

31. A nucleic acid probe comprising at least 15 nucleotides, which probe specifically hybridizes with a nucleic acid encoding a mammalian hp15a receptor, wherein the probe has a unique sequence corresponding to a sequence present within (a) the nucleic acid sequence shown in Figure 1A-1B (Seq. I.D. No. 1) or (b) the reverse complement thereto.
32. The nucleic acid probe of claim 30 or 31, wherein the nucleic acid is DNA.
33. The nucleic acid probe of claim 30 or 31, wherein the nucleic acid is RNA.
34. A nucleic acid probe comprising a nucleic acid molecule of at least 15 nucleotides which is complementary to a unique segment of the sequence of a nucleic acid molecule encoding a mammalian hp15a receptor.
35. A nucleic acid probe comprising a nucleic acid molecule of at least 15 nucleotides which is complementary to the antisense sequence of a unique segment of the sequence of a nucleic acid molecule encoding a mammalian hp15a receptor.
36. An antisense oligonucleotide having a sequence capable of specifically hybridizing to the RNA of claim 5, so as to prevent translation of the RNA.

37. An antisense oligonucleotide having a sequence capable of specifically hybridizing to the genomic DNA of claim 4.
- 5 38. An antisense oligonucleotide of claim 36 or 37, wherein the oligonucleotide comprises chemically modified nucleotides or nucleotide analogues.
- 10 39. An antibody capable of binding to a mammalian hp15a receptor encoded by the nucleic acid of claim 1.
40. An antibody of claim 39, wherein the mammalian hp15a receptor is a human hp15a receptor.
- 15 41. An agent capable of competitively inhibiting the binding of the antibody of claim 39 to a mammalian hp15a receptor.
- 20 42. An antibody of claim 39, wherein the antibody is a monoclonal antibody or antisera.
- 25 43. A pharmaceutical composition comprising (a) an amount of the oligonucleotide of claim 36 capable of passing through a cell membrane and effective to reduce expression of a mammalian hp15a receptor and (b) a pharmaceutically acceptable carrier capable of passing through the cell membrane.
- 30 44. A pharmaceutical composition of claim 43, wherein the oligonucleotide is coupled to a substance which inactivates mRNA.
45. A pharmaceutical composition of claim 44, wherein the substance which inactivates mRNA is a ribozyme.
- 35 46. A pharmaceutical composition of claim 43, wherein the pharmaceutically acceptable carrier comprises

a structure which binds to a mammalian hp15a receptor on a cell capable of being taken up by the cells after binding to the structure.

- 5 47. A pharmaceutical composition of claim 46, wherein the pharmaceutically acceptable carrier is capable of binding to a mammalian hp15a receptor which is specific for a selected cell type.
- 10 48. A pharmaceutical composition which comprises an amount of the antibody of claim 39 effective to block binding of a ligand to a human hp15a receptor and a pharmaceutically acceptable carrier.
- 15 49. A transgenic, nonhuman mammal expressing DNA encoding a mammalian hp15a receptor of claim 1.
50. A transgenic, nonhuman mammal comprising a homologous recombination knockout of the native
20 mammalian hp15a receptor.
51. A transgenic, nonhuman mammal whose genome comprises antisense DNA complementary to the DNA encoding a mammalian hp15a receptor of claims 1 so
25 placed within the genome as to be transcribed into antisense mRNA which is complementary to mRNA encoding the mammalian hp15a receptor and which hybridizes to mRNA encoding the mammalian hp15a receptor, thereby reducing its translation.
- 30 52. The transgenic, nonhuman mammal of claim 49 or 50, wherein the DNA encoding the mammalian hp15a receptor additionally comprises an inducible promoter.
- 35 53. The transgenic, nonhuman mammal of claim 49 or 50, wherein the DNA encoding the mammalian hp15a

receptor additionally comprises tissue specific regulatory elements.

54. A transgenic, nonhuman mammal of claim 49, 50, or
5 51, wherein the transgenic, nonhuman mammal is a mouse.
55. A process for identifying a chemical compound which
10 specifically binds to a mammalian hp15a receptor which comprises contacting cells containing DNA encoding and expressing on their cell surface the mammalian hp15a receptor, wherein such cells do not normally express the mammalian hp15a receptor, with the compound under conditions suitable for binding,
15 and detecting specific binding of the chemical compound to the mammalian hp15a receptor.
56. A process for identifying a chemical compound which
20 specifically binds to a mammalian hp15a receptor which comprises contacting a membrane fragment from a cell extract of cells containing DNA encoding and expressing on their cell surface the mammalian hp15a receptor, wherein such cells do not normally express the mammalian hp15a receptor, with the
25 compound under conditions suitable for binding, and detecting specific binding of the chemical compound to the mammalian hp15a receptor.
57. The process of claim 55 or 56, wherein the
30 mammalian hp15a receptor is a human hp15a receptor.
58. The process of claim 55 or 56, wherein the
mammalian hp15a receptor has substantially the same amino acid sequence as the human hp15a receptor
35 encoded by plasmid hp15a (ATCC Accession No. 209447).

59. The process of claim 55 or 56, wherein the mammalian hp15a receptor has substantially the same amino acid sequence as that shown in Figure 2A-2C (Seq. I.D. No. 2).
- 5 60. The process of claim 55 or 56, wherein the mammalian hp15a receptor has the amino acid sequence shown in Figure 2A-2C (Seq. I.D. No. 2).
- 10 61. The process of claim 59, wherein the compound is not previously known to bind to a mammalian hp15a receptor.
62. A compound identified by the process of claim 61.
- 15 63. A process of claim 59, wherein the cell is an insect cell.
64. The process of claim 59, wherein the cell is a mammalian cell.
- 20 65. The process of claim 64, wherein the cell is nonneuronal in origin.
- 25 66. The process of claim 65, wherein the nonneuronal cell is a COS-7 cell, 293 human embryonic kidney cell, a CHO cell, a NIH-3T3 cell, a mouse Y1 cell, or a LM(tk-) cell.
- 30 67. A process of claim 64, wherein the compound is a compound not previously known to bind to a mammalian hp15a receptor.
68. A compound identified by the process of claim 67.
- 35 69. A process involving competitive binding for identifying a chemical compound which specifically

binds to a mammalian hp15a receptor which comprises separately contacting cells expressing on their cell surface the mammalian hp15a receptor, wherein such cells do not normally express the mammalian hp15a receptor, with both the chemical compound and a second chemical compound known to bind to the receptor, and with only the second chemical compound, under conditions suitable for binding of both compounds, and detecting specific binding of the chemical compound to the mammalian hp15a receptor, a decrease in the binding of the second chemical compound to the mammalian hp15a receptor in the presence of the chemical compound indicating that the chemical compound binds to the mammalian hp15a receptor.

70. A process involving competitive binding for identifying a chemical compound which specifically contacting a membrane fraction from a cell extract of cells expressing on their cell surface the mammalian hp15a receptor, wherein such cells do not normally express the mammalian hp15a receptor, with both the chemical compound and a second chemical compound known to bind to the receptor, and separately with only the second chemical compound, under conditions suitable for binding of both compounds, and detecting specific binding of the chemical compound to the mammalian hp15a receptor, a decrease in the binding of the second chemical compound to the mammalian hp15a receptor in the presence of the chemical compound indicating that the chemical compound binds to the mammalian hp15a receptor.

71. A process of claim 69 or 70, wherein the mammalian hp15a receptor is a human hp15a receptor.

72. The process of claim 71, wherein the human hp15a receptor has substantially the same amino acid sequence as the human hp15a receptor encoded by plasmid hp15a (ATCC Accession No. 209447).
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73. The process of claim 69 or 70, wherein the mammalian hp15a receptor has substantially the same amino acid sequence as that shown in Figure 2A-2C (Seq. I.D. No. 2).
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74. The process of claim 69 or 70, wherein the mammalian hp15a receptor has the amino acid sequence shown in Figure 2A-2C (Seq. I.D. No. 2).
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75. The process of claim 73, wherein the cell is an insect cell.
76. The process of claim 73, wherein the cell is a mammalian cell.
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77. The process of claim 76, wherein the cell is nonneuronal in origin.
78. The process of claim 77, wherein the nonneuronal
- 25 cell is a COS-7 cell, 293 human embryonic kidney cell, a CHO cell, a NIH-3T3 cell, a mouse Y1 cell, or a LM(tk-) cell.
79. The process of claim 78, wherein the compound is
- 30 not previously known to bind to a mammalian hp15a receptor.
80. A compound identified by the process of claim 79.
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81. A method of screening a plurality of chemical compounds not known to bind to a mammalian hp15a receptor to identify a compound which specifically

binds to the mammalian hp15a receptor, which comprises

- 5 (a) contacting cells transfected with and expressing DNA encoding the mammalian hp15a receptor with a compound known to bind specifically to the mammalian hp15a receptor under conditions permitting binding of the compound known to bind;
- 10 (b) contacting the cells resulting from step (a) with the plurality of compounds not known to bind specifically to the mammalian hp15a receptor under conditions permitting binding of compounds known to bind the mammalian hp15a receptor;
- 15 (c) determining whether the binding of the compound known to bind to the mammalian hp15a receptor is reduced in the presence of one or more compound within the plurality of compounds, relative to the binding of the compound in the absence of such one or more compound within the plurality of compounds; and if
- 20 (d) separately determining the binding to the mammalian hp15a receptor of such one or more compound included in the plurality of compounds, so as to thereby identify such one or more compound which specifically binds to the mammalian hp15a receptor.
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- 35 82. A method of screening a plurality of chemical compounds not known to bind to a mammalian hp15a receptor to identify a compound which specifically binds to the mammalian hp15a receptor, which

comprises

- 5 (a) contacting a membrane fraction from cells transfected with and expressing DNA encoding the mammalian hp15a receptor with a compound known to bind specifically to the mammalian hp15a receptor under conditions permitting binding of the compound known to bind;
- 10 (b) contacting the membrane fraction resulting from step (a) with the plurality of compounds not known to bind specifically to the mammalian hp15a receptor, under conditions permitting binding of compounds known to bind the mammalian hp15a receptor;
- 15 (c) determining whether the binding of the compound known to bind to the mammalian hp15a receptor is reduced in the presence of one or more compound within the plurality of compounds, relative to the binding of such one or more compound in the absence of the plurality of compounds; and if so
- 20 (d) separately determining the binding to the mammalian hp15a receptor of such one or more compound included in the plurality of compounds, so as to thereby identify such one or more compound which specifically binds to the mammalian hp15a receptor.
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35 83. A method of claim 81 or 82, wherein the mammalian hp15a receptor is a human hp15a receptor.

84. A method of claim 81 or 82, wherein the cell is a mammalian cell.
85. A method of claim 84, wherein the mammalian cell is non-neuronal in origin.
86. The method of claim 85, wherein the non-neuronal cell is a COS-7 cell, a 293 human embryonic kidney cell, a LM(tk-) cell, a CHO cell, a mouse Y1 cell, or an NIH-3T3 cell.
87. A method of detecting expression of a mammalian hp15a receptor by detecting the presence of mRNA coding for the mammalian hp15a receptor which comprises obtaining total mRNA from the cell and contacting the mRNA so obtained with the nucleic acid probe of claim 30 under hybridizing conditions, detecting the presence of mRNA hybridizing to the probe, and thereby detecting the expression of the mammalian hp15a receptor by the cell.
88. A method of detecting the presence of a mammalian hp15a receptor on the surface of a cell which comprises contacting the cell with the antibody of claim 39 under conditions permitting binding of the antibody to the receptor, detecting the presence of the antibody bound to the cell, and thereby detecting the presence of the mammalian hp15a receptor on the surface of the cell.
89. A method of determining the physiological effects of varying levels of activity of mammalian hp15a receptors which comprises producing a transgenic, nonhuman mammal of claim 52 whose levels of mammalian hp15a receptor activity are varied by use of an inducible promoter which regulates mammalian

hp15a receptor expression.

- 5 90. A method of determining the physiological effects of varying levels of activity of mammalian hp15a receptors which comprises producing a panel of transgenic, nonhuman mammals of claim 52 each expressing a different amount of mammalian hp15a receptor.
- 10 91. A method for identifying an antagonist capable of alleviating an abnormality wherein the abnormality is alleviated by decreasing the activity of a mammalian hp15a receptor comprising administering a compound to the transgenic, nonhuman mammal of claim 49, 52, 53, or 54, and determining whether the compound alleviates the physical and behavioral abnormalities displayed by the transgenic, nonhuman mammal as a result of overactivity of a mammalian hp15a receptor, the alleviation of the abnormality identifying the compound as an antagonist.
- 15 92. An antagonist identified by the method of claim 91.
- 20 93. A pharmaceutical composition comprising a therapeutically effective amount of an antagonist identified by the method of claim 92 and a pharmaceutically acceptable carrier.
- 25 94. A method of treating an abnormality in a subject wherein the abnormality is alleviated by decreasing the activity of a mammalian hp15a receptor which comprises administering to the subject an effective dose of the pharmaceutical composition of claim 93, thereby treating the abnormality.
- 30 95. A method for identifying an agonist capable of alleviating an abnormality in a subject wherein the
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abnormality is alleviated by increasing the activity of a mammalian hp15a receptor comprising administering a compound to the transgenic, nonhuman mammal of claim 49, 52, 53, or 54, and
5 determining whether the compound alleviates the physical and behavioral abnormalities displayed by the transgenic, nonhuman mammal, the alleviation of the abnormality identifying the compound as an agonist.

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96. An agonist identified by the method of claim 95.

97. A pharmaceutical composition comprising a therapeutically effective amount of an agonist
15 identified by the method of claim 95 and a pharmaceutically acceptable carrier.

98. A method of treating an abnormality in a subject wherein the abnormality is alleviated by increasing
20 the activity of a mammalian hp15a receptor which comprises administering to the subject an effective dose of the pharmaceutical composition of claim 97, thereby treating the abnormality.

25 99. A method for diagnosing a predisposition to a disorder associated with the activity of a specific mammalian allele which comprises:

30 (a) obtaining DNA of subjects suffering from the disorder;

(b) performing a restriction digest of the DNA with a panel of restriction enzymes;

35 (c) electrophoretically separating the resulting DNA fragments on a sizing gel;

- 5 (d) contacting the resulting gel with a nucleic acid probe capable of specifically hybridizing with a unique sequence included within the sequence of a nucleic acid molecule encoding a mammalian hp15a receptor and labeled with a detectable marker;
- 10 (e) detecting labeled bands which have hybridized to the DNA encoding a mammalian hp15a receptor of claim 1 labeled with a detectable marker to create a unique band pattern specific to the DNA of subjects suffering from the disorder;
- 15 (f) preparing DNA obtained for diagnosis by steps (a)-(e); and
- 20 (g) comparing the unique band pattern specific to the DNA of subjects suffering from the disorder from step (e) and the DNA obtained for diagnosis from step (f) to determine whether the patterns are the same or different and to diagnose thereby predisposition to the disorder if the
- 25 patterns are the same.
100. The method of claim 99, wherein a disorder associated with the activity of a specific
- 30 mammalian allele is diagnosed.
101. A method of preparing the purified mammalian hp15a receptor of claim 11 which comprises:
- 35 (a) inducing cells to express the mammalian hp15a receptor;

- (b) recovering the mammalian hp15a receptor from the induced cells; and
- (c) purifying the mammalian hp15a receptor so recovered.

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102. A method of preparing the purified mammalian hp15a receptor of claim 11 which comprises:

- (a) inserting nucleic acid encoding the mammalian hp15a receptor into a suitable vector;
- (b) introducing the resulting vector into a suitable host cell;
- (c) placing the resulting cell in suitable conditions permitting the production of the isolated mammalian hp15a receptor;
- (d) recovering the mammalian hp15a receptor produced by the resulting cell; and
- (e) purifying and/or isolating the mammalian hp15a receptor so recovered.

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103. A process for determining whether a chemical compound is a mammalian hp15a receptor agonist which comprises contacting cells transfected with and expressing DNA encoding the mammalian hp15a receptor with the compound under conditions permitting the activation of the mammalian hp15a receptor, and detecting an increase in mammalian hp15a receptor activity, so as to thereby determine whether the compound is a mammalian hp15a receptor agonist.

104. A process for determining whether a chemical compound is a mammalian hp15a receptor antagonist which comprises contacting cells transfected with and expressing DNA encoding the mammalian hp15a receptor with the compound in the presence of a known mammalian hp15a receptor agonist, under conditions permitting the activation of the mammalian hp15a receptor, and detecting a decrease in mammalian hp15a receptor activity, so as to thereby determine whether the compound is a mammalian hp15a receptor antagonist.
105. A process of claim 103 or 104, wherein the mammalian hp15a receptor is a human hp15a receptor.
106. A pharmaceutical composition which comprises an amount of a mammalian hp15a receptor agonist determined by the process of claim 103 effective to increase activity of a mammalian hp15a receptor and a pharmaceutically acceptable carrier.
107. A pharmaceutical composition of claim 106, wherein the mammalian hp15a receptor agonist is not previously known.
108. A pharmaceutical composition which comprises an amount of a mammalian hp15a receptor antagonist determined by the process of claim 104 effective to reduce activity of a mammalian hp15a receptor and a pharmaceutically acceptable carrier.
109. A pharmaceutical composition of claim 108, wherein the mammalian hp15a receptor antagonist is not previously known.

110. A process for determining whether a chemical compound specifically binds to and activates a mammalian hp15a receptor, which comprises contacting cells producing a second messenger response and expressing on their cell surface the mammalian hp15a receptor, wherein such cells do not normally express the mammalian hp15a receptor, with the chemical compound under conditions suitable for activation of the mammalian hp15a receptor, and measuring the second messenger response in the presence and in the absence of the chemical compound, a change in the second messenger response in the presence of the chemical compound indicating that the compound activates the mammalian hp15a receptor.
111. The process of claim 110, wherein the second messenger response comprises chloride channel activation and the change in second messenger is an increase in the level of inward chloride current.
112. A process for determining whether a chemical compound specifically binds to and inhibits activation of a mammalian hp15a receptor, which comprises contacting cells producing a second messenger response and expressing on their cell surface the mammalian hp15a receptor, wherein such cells do not normally express the mammalian hp15a receptor, with both the chemical compound and a second chemical compound known to activate the mammalian hp15a receptor, and separately with only the second chemical compound, under conditions suitable for activation of the mammalian hp15a receptor, and measuring the second messenger response in the presence of only the second chemical compound and in the presence

5 of both the second chemical compound and the chemical compound, a smaller change in the second messenger response in the presence of both the chemical compound and the second chemical compound than in the presence of only the second chemical compound indicating that the chemical compound inhibits activation of the mammalian hp15a receptor.

10 113. The process of claim 112, wherein the second messenger response comprises chloride channel activation and the change in second messenger response is a smaller increase in the level of
15 inward chloride current in the presence of both the chemical compound and the second chemical compound than in the presence of only the second chemical compound.

20 114. A process of any one of claims 110, 111, 112 or 113, wherein the mammalian hp15a receptor is a human hp15a receptor.

25 115. The process of claim 114, wherein the human hp15a receptor has substantially the same amino acid sequence as encoded by the plasmid hp15a (ATCC Accession No. 209447).

30 116. The process of claim 114, wherein the human hp15a receptor has substantially the same amino acid sequence as that shown in Figure 2A-2C (Seq. I.D. No. 2).

35 117. The process of claim 114, wherein the human hp15a receptor has an amino acid sequence identical to the amino acid sequence shown in Figure 2A-2C (Seq. I.D. No. 2).

118. The process of any one of claims 110, 111, 112, 113, 114, 115, 116, or 117, wherein the cell is an insect cell.
- 5 119. The process of any one of claims 110, 111, 112, 113, 114, 115, 116, or 117, wherein the cell is a mammalian cell.
- 10 120. The process of claim 119, wherein the mammalian cell is nonneuronal in origin.
- 15 121. The process of claim 120, wherein the nonneuronal cell is a COS-7 cell, CHO cell, 293 human embryonic kidney cell, NIH-3T3 cell or LM(tk-) cell.
- 20 122. The process of claim 119, wherein the compound is not previously known to bind to a mammalian hp15a receptor.
- 25 123. A compound determined by the process of claim 122.
- 30 124. A pharmaceutical composition which comprises an amount of a mammalian hp15a receptor agonist determined by the process of claim 110 or 111 effective to increase activity of a mammalian hp15a receptor and a pharmaceutically acceptable carrier.
- 35 125. A pharmaceutical composition of claim 124, wherein the mammalian hp15a receptor agonist is not previously known.
126. A pharmaceutical composition which comprises an amount of a mammalian hp15a receptor antagonist determined by the process of claim 112 or 113

effective to reduce activity of a mammalian hp15a receptor and a pharmaceutically acceptable carrier.

5 127. A pharmaceutical composition of claim 126, wherein the mammalian hp15a receptor antagonist is not previously known.

10 128. A method of screening a plurality of chemical compounds not known to activate a mammalian hp15a receptor to identify a compound which activates the mammalian hp15a receptor which comprises:

15 (a) contacting cells transfected with and expressing the mammalian hp15a receptor with the plurality of compounds not known to activate the mammalian hp15a receptor, under conditions permitting activation of the mammalian hp15a receptor;

20 (b) determining whether the activity of the mammalian hp15a receptor is increased in the presence of one or more of the compounds; and if so

25 (c) separately determining whether the activation of the mammalian hp15a receptor is increased by such compound included in the plurality of compounds, so
30 as to thereby identify such compound which activates the mammalian hp15a receptor.

129. A method of claim 128, wherein the mammalian hp15a receptor is a human hp15a receptor.

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130. A method of screening a plurality of chemical compounds not known to inhibit the activation of

a mammalian hp15a receptor to identify a compound which inhibits the activation of the mammalian hp15a receptor, which comprises:

- 5 (a) contacting cells transfected with and expressing the mammalian hp15a receptor with the plurality of compounds in the presence of a known mammalian hp15a receptor agonist, under conditions
10 permitting activation of the mammalian hp15a receptor;
- (b) determining whether the activation of the mammalian hp15a receptor is reduced in the
15 presence of one or more compound within the plurality of compounds, relative to the activation of the mammalian hp15a receptor in the absence of the plurality of such compound within compounds; and if
20 so
- (c) separately determining the inhibition of activation of the mammalian hp15a receptor for such compound included in the
25 plurality of compounds, so as to thereby identify such compound which inhibits the activation of the mammalian hp15a receptor.
- 30 131. A method of claim 130, wherein the mammalian hp15a receptor is a human hp15a receptor.
132. A method of any one of claims 128, 129, 130, or 131, wherein the cell is a mammalian cell.
- 35 133. A method of claim 132, wherein the mammalian cell is non-neuronal in origin.

134. The method of claim 133, wherein the non-neuronal cell is a COS-7 cell, a 293 human embryonic kidney cell, a LM(tk-) cell or an NIH-3T3 cell.
- 5 135. A pharmaceutical composition comprising a compound identified by the method of claim 128 or 129 effective to increase mammalian hp15a receptor activity and a pharmaceutically acceptable carrier.
- 10 136. A pharmaceutical composition comprising a compound identified by the method of claim 130 or 131 effective to decrease mammalian hp15a receptor activity and a pharmaceutically acceptable carrier.
- 15 137. A method of treating an abnormality in a subject wherein the abnormality is alleviated by increasing the activity of a mammalian hp15a receptor which comprises administering to the subject an amount of a compound which is a mammalian hp15a receptor agonist effective to treat the abnormality.
- 20 138. A method of claim 137, wherein the abnormality is a respiratory disorder, asthma, an immune disorder, a gestational disorder, anxiety, depression, an appetite regulation disorder, an affective disorder, an endocrine regulation disorder, a neuroendocrine regulation disorder, a cognitive disorder, a memory disorder, a sensory modulation and transmission disorder, a motor coordination disorder, a sensory integration disorder, a dopaminergic function disorder, or a developmental disorder.
- 25 30 35 139. A method of treating an abnormality in a subject

5 wherein the abnormality is alleviated by decreasing the activity of a mammalian hp15a receptor which comprises administering to the subject an amount of a compound which is a mammalian hp15a receptor antagonist effective to treat the abnormality.

10 140. A method of claim 139, wherein the abnormality is a respiratory disorder, asthma, an immune disorder, a gestational disorder, a cognitive disorder, a memory disorder, an endocrine regulation disorder, a neuroendocrine regulation disorder, anxiety, depression, an appetite regulation disorder, an affective disorder, a sensory modulation and transmission disorder, a sensory integration disorder, a dopaminergic function disorder, a developmental disorder, or a motor coordination disorder.

20 141. A process for making a composition of matter which specifically binds to a mammalian hp15a receptor which comprises identifying a chemical compound using the process of any of claims 55, 56, 69, 70, 81, 82, 91, 95, 103, 104, 110, 112, 25 128, or 130 and then synthesizing the chemical compound or a novel structural and functional analog or homolog thereof.

30 142. The process of claim 141 wherein the mammalian hp15a receptor is a human hp15a receptor.

35 143. A process for preparing a pharmaceutical composition which comprises admixing a pharmaceutically acceptable carrier and a pharmaceutically acceptable amount of a chemical compound identified by the process of any of claims 59, 69, 70, 81, 82, 91, 95, 103, 104, 110,

112, 128, or 130 or a novel structural and functional analog or homolog thereof.

144. The process of claim 143 wherein the mammalian
5 hp15a receptor is a human hp15a receptor.